d spacing value and gave one peak. This one peak is referred to herein. The fcc-oriented d-(111) spacing in the three layers CoFe/Cu/CoFe above Cu is 2.054 nanometers; and the fcc-oriented d-(111) spacing in the three layers CoFe/Cu/CoFe above Au is 2.086 nanometers. As will be mentioned hereunder, at the intermediate of the d-(111) spacing above Cu and Au, the magnetostriction in the films could be suitably controlled and reduced. Therefore, it has been found that the too small d-(111) spacing above Cu and the too large d-(111) spacing above Au are both unfavorable.

As mentioned above, it has been found that forming the free layer of CoFe on the merely fcc(111)-oriented underlayer is unsatisfactory in point of magnetostriction control. For reducing the magnetostriction, employable is a structure where CoFe is formed on an fcc(111)-oriented $Ni_{80}Fe_{20}$ at around zero magnetostriction level so that the entire free layer is made to have zero magnetostriction owing to that NiFe having nearly zero magnetostriction (e.g., the constitution (a) noted above). However, as so mentioned hereinabove, this structure is still problematic in that its MR characteristic is still degraded in thermal treatment.

As mentioned above, the MR ratio reduction in conventional spin valve films after thermal treatment is great, and the improvement in the thermal stability of the films is desired.

As one measure for increasing the MR ratio in spin valve films, specular reflection is widely noticed. However, the reflective film in conventional spin valve films is of an insulating material such as oxides, etc. In addition, some conventional spin valve films utilize the reflectivity on their surface. Therefore, the conventional spin valve films of those types often induce ESD, for example, owing to the increase in the contact resistance with lead electrodes, or protective films, if formed on the spin valve films, cancel the mirror reflectivity of the films. Thus, the conventional spin valve films have such various problems in their practical applications. Apart from those, another technique of utilizing interfacial specular reflection is being investigated. However, this requires a specific underlayer. Therefore, spin valve films utilizing such interfacial specular reflection are poorly practicable. For these reasons and in consideration of the practical applicability of spin valve films to devices and magnetic heads, it is desirable that the MR ratio in spin valve films is increased by specular reflection.

In addition, for improving the soft magnetic characteristics of spin valve films, it is desired to control and reduce the magnetostriction in Co-based magnetic layers of CoFe alloys or the like.

In particular, the mirror reflectivity of spin valve

films to increase the MR ratio in the films and to reduce the magnetostriction therein must not be degraded in thermal treatment for ensuring the practical application of the films.

This embodiment of the invention is to solve the problems noted above, and its object is to provide a magnetoresistance effect device in which the MR characteristic of the spin valve film is prevented from being degraded in thermal treatment, and to provide a magnetoresistance effect device in which the MR ratio in the spin valve film is increased by specular reflection in consideration of its practical applications, in which the magnetostriction in the spin valve film is reduced, and in which the MR ratio reduction and the magnetostriction increase in the spin valve film in thermal treatment are both retarded. Another object is to provide a magnetic head and a magnetic recording/reproducing system incorporating the magnetoresistance effect device and therefore having improved recording/reproducing characteristics and improved practical applicability.

The embodiment to solve the problems noted above is described below with reference to the accompanying drawings.

Fig. 32 is a sectional view of the essential structure of one embodiment of the magnetoresistance effect device (MR device) of the invention. In Fig. 32, 1 is a first magnetic layer, and 2 is a second magnetic layer. These first and second magnetic layers 1 and 2 are laminated via a nonmagnetic spacer